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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,301	04/27/2004	Daniel J. Farrar	SYB/0099.01	3300

31779	7590	07/26/2006	EXAMINER

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ART UNIT	PAPER NUMBER
2168	

DATE MAILED: 07/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/709,301	FARRAR ET AL.
	Examiner	Art Unit	
	Dangelino N. Gortayo	2168	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 April 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-43</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-43</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 April 2004</u> is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/06/04 3/17/05</u>.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-43 are pending.

Information Disclosure Statement

2.   An initialed and dated copy of Applicant's IDS form 1449, filed 3/17/2005, is

attached to the instant Office action.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 1-43 are rejected under 35 U.S.C. 102(e) as being anticipated by <u>Lenzie</u>

("Lenzie" US Patent 6,728,720 B1)

        As per claim 1, <u>Lenzie</u> teaches "a method for recommending database indexes to

be created for optimizing system performance, the method comprising:" (see Abstract)

"capturing a workload representative of database queries employed during

system use;" (column 5 lines 17-22, wherein a copy is made of all the SQL queries

supplied to the engine over a selected period of time)

"creating virtual indexes for optimizing system performance during execution of

the database queries captured in the workload;" (column 5 lines 22-28 and column 8

lines 8-13, wherein an index optimizer creates a set of preferred indexes for a database)

"computing cost benefits for different combinations of the virtual indexes;"

(column 9 lines 24-40, wherein the cost of indexes are calculated)

"and recommending physical indexes to be created based on virtual indexes that

have favorable cost benefits for the captured workload." (column 12 lines 53-59,

wherein an index with the highest cost saving is selected)

As per claim 2, Lenzie teaches "said virtual indexes comprise in-memory data

structures corresponding to sets of potential physical indexes." (column 10 line 66 –

column 11 line 9)

As per claim 3, Lenzie teaches "the capturing step includes: displaying a screen

input button that a user may invoke to record a usage session as a workload." (column

9 lines 7-16, wherein a user invokes the testing using representative data)

As per claim 4, Lenzie teaches "the workload represents user execution of a

database application with a typical workload that is contemplated for the application."

(column 8 line 63 – column 9 line 6, wherein up-to-date statistics are kept for the

database queries)

As per claim 5, <u>Lenzie</u> teaches "the workload includes information recording text of all the queries operating during the capture of the workload." (column 9 lines 24-30)

As per claim 6, <u>Lenzie</u> teaches "the workload includes information recording settings for certain options that affect how queries are optimized." (column 8 lines 8-16)

As per claim 7, <u>Lenzie</u> teaches "the capturing step includes: capturing information about a set of workloads to define a problem instance." (column 9 lines 41-54)

As per claim 8, <u>Lenzie</u> teaches " setting a limit on how much disk space is available for physical indexes." (column 9 lines 55-61, wherein the size of the tables is limited)

As per claim 9, <u>Lenzie</u> teaches "the recommending step takes into account the limit on disk space available for physical indexes." (column 5 lines 10-16)

As per claim 10, <u>Lenzie</u> teaches "the recommending step includes: if the physical indexes to be recommended for creation exceed the limit on disk space available for physical indexes, removing some of the physical indexes from consideration." (column 12 lines 33-52, wherein index maintenance is done)

As per claim 11, <u>Lenzie</u> teaches "the physical indexes removed from consideration are ones having less favorable cost benefits for the captured workload." (column 13 lines 57-67)

As per claim 12, <u>Lenzie</u> teaches "the physical indexes removed from consideration comprise at least 20 percent of bottom performing indexes considered for recommendation." (column 13 lines 31-47)

As per claim 13, Lenzie teaches "specifying whether certain types of indexes should be considered at all." (column 14 lines 1-9)

As per claim 14, Lenzie teaches "the creating virtual indexes step includes: searching for relevant indexes that will help the system's optimizer use sargable predicates for partial index scans." (column 14 lines 1-6, wherein a preferred index set based on recorded patterns of user queries is index searchable)

As per claim 15, Lenzie teaches "the optimizer creates virtual indexes without specifying ordering of columns used in sargable equality predicates." (column 11 lines 53-65)

As per claim 16, Lenzie teaches "the creating virtual indexes step includes: searching for relevant indexes that will help provide useful orderings." (column 12 line 60 – column 13 line 4, wherein preferred indexes are searched for ordering)

As per claim 17, Lenzie teaches "columns of virtual indexes may be order-independent "don't care" columns that satisfy some interesting ordering wish list of the system's optimizer." (column 13 line 5-18)

As per claim 18, Lenzie teaches "columns of virtual indexes may have an unspecified sortedness." (column 13 line 19-22)

As per claim 19, Lenzie teaches "collapsing some of the virtual indexes together, if feasible for the workload." (column 13 lines 48-56)

As per claim 20, Lenzie teaches "the collapsing step includes: identifying that columns of one virtual index are a superset of another the columns of another virtual

index, and that both indexes may be combined into a single virtual index that is feasible

for the workload;" (column 13 lines 38-43)

"and identifying that sortedness of a column of a virtual index, if unspecified, may

be specified to allow it to be combined with an index with identical columns but specified

sortedness;" (column 13 lines 42-47)

"and identifying that a virtual index that has columns of opposite sortedness of a

second virtual index, and that both indexes may be combined into a single virtual index."

(column 13 lines 48-56)

As per claim 21, <u>Lenzie</u> teaches "polling periodically in the method to ensure that

the system is working with accurate cost information." (column 5 lines 29-33, wherein a

user is polled about system performance)

As per claim 22, <u>Lenzie</u> is disclosed as per claim 1 above. Additionally, <u>Lenzie</u>

teaches "A computer-readable medium having processor-executable instructions"

(column 4 lines 15-23)

As per claim 23, <u>Lenzie</u> is disclosed as per claim 1 above. Additionally, <u>Lenzie</u>

teaches "A downloadable set of processor-executable instructions" (column 4 lines 15-

23)

As per claim 24, <u>Lenzie</u> teaches "A system that recommends database indexes

to be created for optimizing system performance, the system comprising:" (see

Abstract)

"a database system that executes database queries;" (column 4 lines 43-50)

"and an index consultant for capturing a workload representative of database queries executed during typical system use;" (column 5 lines 17-22, wherein a copy is made of all the SQL queries supplied to the engine over a selected period of time) "creating virtual indexes for optimizing system performance during execution of the database queries captured in the workload;" (column 5 lines 22-28 and column 8 lines 8-13, wherein an index optimizer creates a set of preferred indexes for a database) "computing cost benefits for different combinations of the virtual indexes;" (column 9 lines 24-40, wherein the cost of indexes are calculated) "and recommending physical indexes to be created based on virtual indexes that have favorable cost benefits for the captured workload." (column 12 lines 53-59, wherein an index with the highest cost saving is selected)

As per claim 25, Lenzie teaches "said virtual indexes comprise in-memory data structures corresponding to sets of potential physical indexes." (column 10 line 66 – column 11 line 9)

As per claim 26, Lenzie teaches "the index consultant displays a screen input button that a user may invoke to record a usage session as a workload." (column 9 lines 7-16, wherein a user invokes the testing using representative data)

As per claim 27, Lenzie teaches "the workload represents user execution of a database application with a typical workload that is contemplated for the application." (column 8 line 63 – column 9 line 6, wherein up-to-date statistics are kept for the database queries)

As per claim 28, <u>Lenzie</u> teaches "the workload includes information recording text of all the queries operating during the capture of the workload." (column 9 lines 24-30)

As per claim 29, <u>Lenzie</u> teaches "the workload includes information recording settings for certain options that affect how queries are optimized." (column 8 lines 8-16)

As per claim 30, <u>Lenzie</u> teaches "the index consultant captures information about a set of workloads to define a problem instance." (column 9 lines 41-54)

As per claim 31, <u>Lenzie</u> teaches " the index consultant may receive information specifying a limit on how much disk space is available for physical indexes." (column 9 lines 55-61, wherein the size of the tables is limited)

As per claim 32, <u>Lenzie</u> teaches "the index consultant takes into account the limit on disk space available for physical indexes." (column 5 lines 10-16)

As per claim 33, <u>Lenzie</u> teaches "the index consultant removes some of the physical indexes from consideration, when sufficient disk space is unavailable." (column 12 lines 33-52, wherein index maintenance is done)

As per claim 34, <u>Lenzie</u> teaches "the physical indexes removed from consideration are ones having less favorable cost benefits for the captured workload." (column 13 lines 57-67)

As per claim 35, <u>Lenzie</u> teaches "the physical indexes removed from consideration comprise at least 20 percent of bottom performing indexes considered for recommendation." (column 13 lines 31-47)

As per claim 36, <u>Lenzie</u> teaches "the index consultant allows user input specifying whether certain types of indexes should be considered at all." (column 14 lines 1-9)

As per claim 37, <u>Lenzie</u> teaches "the index consultant searches for relevant indexes that will help the system's optimizer use sargable predicates for partial index scans." (column 14 lines 1-6, wherein a preferred index set based on recorded patterns of user queries is index searchable)

As per claim 38, <u>Lenzie</u> teaches "the optimizer creates virtual indexes without specifying ordering of columns used in sargable equality predicates." (column 11 lines 53-65)

As per claim 39, <u>Lenzie</u> teaches "the index consultant searches for relevant indexes that will help provide useful interesting (order or grouping) properties." (column 12 line 60 – column 13 line 4, wherein preferred indexes are searched for ordering)

As per claim 40, <u>Lenzie</u> teaches "columns of indexes created may reflect order-independent "don't care" columns that satisfy some interesting ordering wish lists of the system's optimizer." (column 13 line 5-18)

As per claim 41, <u>Lenzie</u> teaches "the index consultant attempts to collapse some of the virtual indexes together, if feasible for the workload." (column 13 lines 48-56)

As per claim 42, <u>Lenzie</u> teaches "the index consultant attempts to identify that columns of one index are a superset of the columns of another index, and that both indexes may be combined into a single index that is feasible for the workload." (column 13 lines 38-56)

As per claim 43, <u>Lenzie</u> teaches "operation of the index consultant may be polled

during operation to ensure that the system is working with accurate cost information."

(column 5 lines 29-33, wherein a user is polled about system performance)

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Adya et al. (US Patent 6,266,658 B1)

Hall (US Patent 6,934,701 B1)

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Dangelino N. Gortayo whose telephone number is

(571)272-7204. The examiner can normally be reached on M-F 7:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tim T. Vo can be reached on (571)272-3642. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dangelino N. Gortayo   Tim T. Vo
Examiner   SPE

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